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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Takashi Yamaguchi

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EXAMINER

CECIL, TERRY K

ART UNIT

PAPER NUMBER

1797

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/622,660	Applicant(s) YAMAGUCHI ET AL.	
	Examiner Mr. Terry K. Cecil	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 11, 17-30 and 35-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-11, 17-30 and 35-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Claim Rejections - 35 USC § 103***

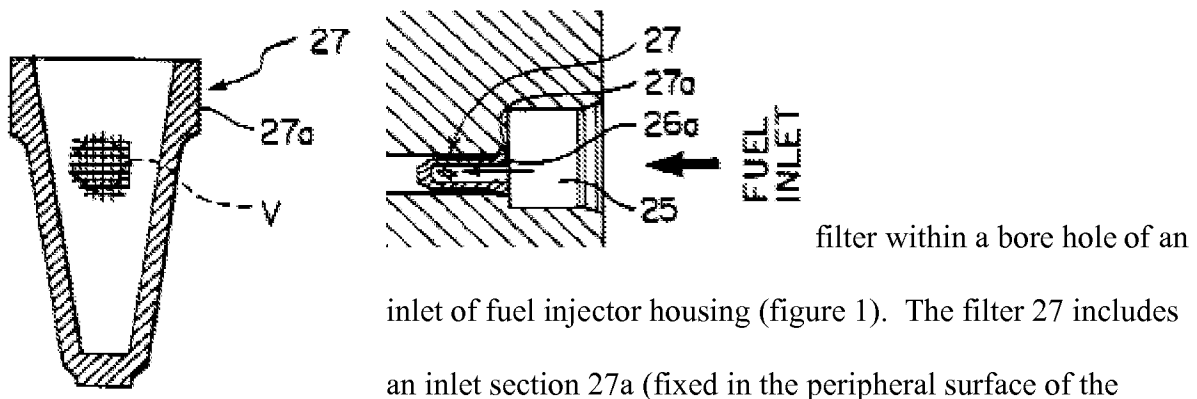
1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1, 3, 10-11, 17, 19-20, 22, 29-30, 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isozumi et al. (U.S. 6,190,139 B1) in view of Verlag (US Publication XP-000766379). Isozumi teaches an injector comprising a

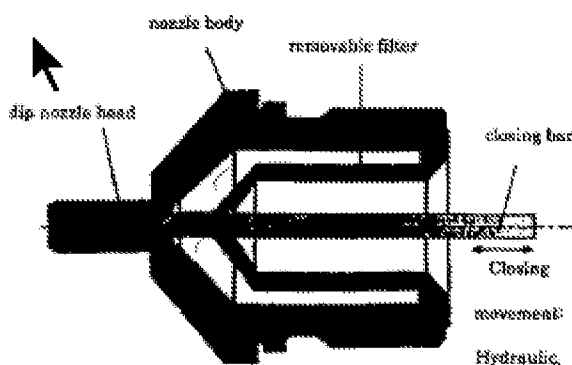


filter within a bore hole of an inlet of fuel injector housing (figure 1). The filter 27 includes an inlet section 27a (fixed in the peripheral surface of the passageway of the bore hole), a closed end, and a filter section therebetween. The filter is formed such that a tubular passage exists between the filter section and the inner surface of the bore. Because of the shape of the sides of the closed end, the cross-sectional area between the

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outer surface thereof and the inner surface of the bore (at the closed end) gradually increases in a downstream direction. Fluid enters through the opening of the inlet section, passes through an inside of the filter section, passes through the plurality of holes, and then flows through the tubular fluid passage toward a downstream of the tubular fluid passage. [as in claims 1, 10-11, 17, 20, 35 and 37]. Since the high pressure pump (and the filter) is connected to an injector (as taught in col. 3 lines 45-52), the injector can be said to “comprise” the filter and the housing thereof, as claimed. The end is considered to be *approximately* conically-shaped, the diameter thereof increasing in a fluid flow direction [as in claim 3].

However, Isozumi fails to explicitly disclose a tubular fluid passage that has a cross-sectional area equivalent to or smaller than a summation of cross sectional areas of the holes at every point along the length of the filter section (claims 1 and 11); or at a point downstream of the most downstream one of the holes of the filter section, the tubular fluid passage having a cross-sectional area that is equivalent to or smaller than a summation of cross-sectional areas of all of the holes of the filter section (claims 35 and 37). However, such is made obvious by Verlag (XP-000766379):



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Verlag teaches filter apertures to have a total cross-sectional area that is considerably greater than the borehole of the machine nozzle in order to reduce *to a minimum* the pressure loss across the filter (as a result, all cross-sections of the tubular passage are necessarily smaller than the total filter aperture areas) [as in claims 1, 10-11, 17, 19-20, 22, 29-30, 35-38]. In order to have *a minimum pressure loss*, the skilled man would understand the borehole of which Verlag speaks to be the entire borehole passage through the nozzle body. (The filter having a total aperture open area smaller than any flow cross-section through the nozzle would NOT minimize the pressure loss). The total cross-section of the filter boreholes is larger than all cross-sections of the borehole passage through which the fluid flows. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Isozumi in view of Verlag (XP-000766379), since Verlag teaches the benefit of minimizing the pressure loss at high velocities of supplying the solution.

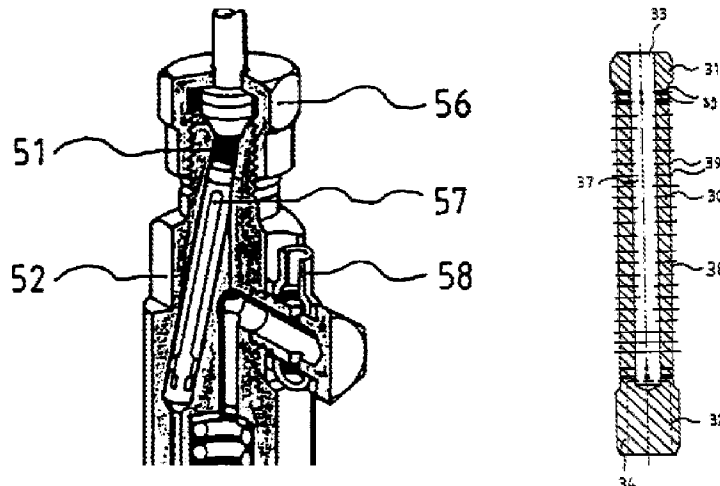
Also, since the amount of fluid allowed through the tubular flow passage depends upon the cross-sections thereof, the passage has a structure that allows it to perform the function of regulating the flow therethrough.

3. Claims 1-3, 10-11, 17-22, 29-30 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 5-269316, hereinafter '316, in view of GB 2324571, hereinafter '571. '316 teaches a filter including a hemispherically-shaped closed end, an inlet section, and a filtering section 2 therebetween and the claimed flow configuration. He doesn't explicitly teach the

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claimed relative sizing between the tubular passage cross-section and the total filter pore cross-sections.

However, such is taught by '571.



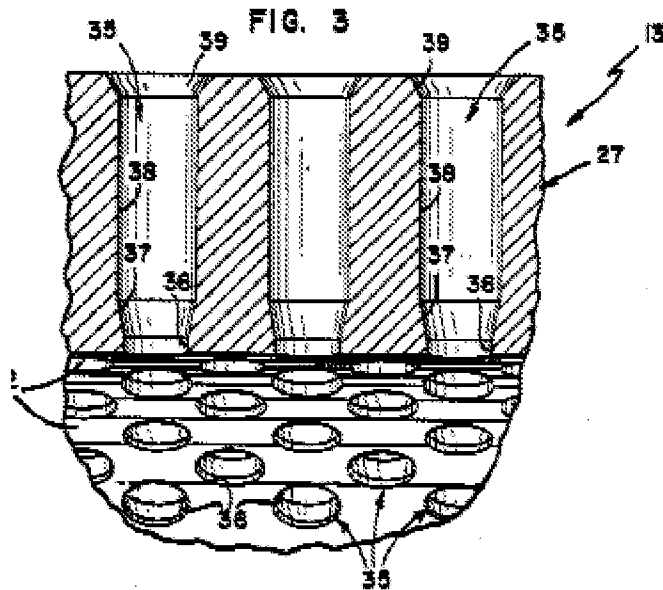
In the case of all of the illustrated exemplified embodiments the entire orifice cross-section of all orifices disposed in the filter element is larger than or equal to the cross-section of the fuel duct.

The filter is placed in the fuel duct of an injector—as described in e.g. his claim 1.

It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the entire cross-section of all the orifices of the filter section of '316 to be larger than the cross section of the fuel duct as taught by '571, since '571 teaches the benefit of the slightest possible flow resistance against the fuel (page 5, last line to page 6, line 4).

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4. Claims 4-8 and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over EITHER OF Isozumi in view of Verlag as applied above OR '316 in view of '571, as applied above and in further view of Neuman (U.S. 5,062,952).



Neuman teaches filter openings having the claimed tapers, steps to a taper (e.g. that from straight bore 36 to tapered bore 37), and different shapes and combinations of shapes [as in claims 4-8]. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the filter section with the filter opening

design of Neuman in the invention of modified Isozumi or the modified '316, since Neuman teaches the benefits of preventing clogging of bores (col. 4, lines 31-37) and using a smaller mass of filter element with the same number of openings without weakening the filter element (col. 4, lines 50-55).

As for newly added claims 23-25, it is pointed out that the arrangement of the circular holes of Neuman also includes holes disposed at a substantially regular interval along a substantially helical line.

5. Claims 2, 18, 21, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isozumi in view of Verlag as applied above, and in further view of Stamstad (U.S.

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4,882,055). As shown in his drawings, Stamstad teaches a hemispherically-shaped closed end [as in claim 2] and a configuration that would result in a tubular passageway of substantially constant cross-sectional area [as in claims 18 and 21]. He also teaches circular openings [as in claims 23 and 26]. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the filter of the modified Isozumi to be configured as in Stamstad, since Stamstad teaches the benefit of a filter that is molded shaped and ready for use without the need for further processing and that allows for a filter that is easily cleaned (col. 6).

6. Claims 24-25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over ‘316 in view of ‘571 and in further view of JP 2002331209, hereinafter ‘209. As shown, e.g. figure 3, the helical line of pores is shown in a substantially regular interval. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the pores of the modified ‘316 to be helically-arranged, since ‘209 teaches the benefit of bores that are continuously and easily formed and for use in the same environment—fuel filtering in an injector.

Response to Arguments

7. Applicant's arguments filed 10-6-2008 have been fully considered but they are not persuasive. Concerning Verlag, in order to have *a minimum pressure loss*, the skilled man would understand the borehole of which Verlag speaks to be the entire borehole passage through the nozzle body through which the fluid flows. The total cross-section of the filter boreholes is larger than all cross-sections of the borehole passage through which the fluid flows (which would

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mean that all the tubular passageway cross-sections are smaller than total filter apertures).

Otherwise, the filter having a total aperture open area smaller than any flow cross-section through the nozzle would NOT minimize the pressure loss. (The skilled man seeking to minimize the pressure loss across the filter would not have the total flow aperture area of the filter to be smaller than any flow area through the nozzle—since such would INCREASE PRESSURE LOSS).

Concerning ‘571, the filter is positioned within the fuel duct, as explained in e.g. the abstract, page 11 and the claims of the reference. Contrary to Applicant's remarks, nothing is found on page 11 of the reference that indicates that “the fuel duct corresponds to the jet orifice 64”.

However, it is clear that the filter is positioned within a cylindrical fuel duct (see e.g. figures 4 and 5) and that the entire orifice cross-section of all orifices disposed in the filter element is larger than or equal to the cross-section of the fuel duct—which would require the tubular passage cross-sections to be smaller than the total cross-sections of all the orifices.

Concerning modifying the openings of Isozumi or JP ‘316 to have the tapers, steps, circular shape, or helical arrangement of Neuman, the examiner contends that such a substitution would have been within ordinary skill and that having the square openings of isoizumi to be e.g. stepped or transition (taper) from a square or circular opening would not destroy the invention thereof. In addition it is noted that “[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.”, *In re Sneed*, 710 F.2d 1544, 1550, 218 USPQ 385, 389 (Fed. Cir. 1983); and *In re Nievelt*, 482 F.2d 965, 179 USPQ

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224, 226 (CCPA 1973) (“Combining the teachings of references does not involve an ability to combine their specific structures.”).

Concerning the modification of JP ‘316 with JP ‘209, the examiner contends that having or adding apertures in the claimed arrangement would have been within ordinary skill for the benefits listed in the rejection above.

Applicant’s request for an interview is acknowledged. Attempts made to contact the Applicant to discuss whether such an interview is warranted or would be fruitful were unsuccessful. After reviewing this action, Applicant may request an interview after-final in accordance with MPEP 713.09.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Terry K. Cecil whose telephone number is (571) 272-1138. The examiner can normally be reached on 8:00a-4:30p M-F..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mr. Terry K. Cecil/
Primary Examiner, Art Unit 1797

tkc